



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/710,847 | 08/06/2004 | Anil K. Chinthakindi | BUR920040112US1 | 6756 |
| 45601 | 7590 | 01/25/2006 | EXAMINER | |
| SCULLY, SCOTT, MURPHY & PRESSNER 400 GARDEN CITY PLAZA GARDEN CITY, NY 11530 | | | CHIU, TSZ K | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2822 | |

DATE MAILED: 01/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/710,847

Applicant(s)

CHINTHAKINDI ET AL.

Examiner

Tsz K. Chiu

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) 11-40 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>8/6/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of group I, claims 1-10, in the reply filed on 12/28/05 is acknowledged.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1-3, 5-8, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Wu (6,586,311).

With respect to claim 1, Wu discloses a semiconductor substrate including at least one front-end-of-the-line device (Figure 4) located on a surface thereof, at least one resistor (Figure 8) located on, or in close proximity to, said surface of said semiconductor substrate (400, For example Fig. 8), said at least one resistor (Figure 8) comprising at least a conductive metal (600, For example Fig. 8), and first level of metallization (700, For example Fig. 9) above said at least one resistor.

With respect to claim 2, Wu discloses a trench isolation region (460, For example Fig. 9) in said semiconductor substrate (400, For example Fig. 9), said at least one resistor (640, 540, For example Fig. 9) is positioned on said trench isolation region (460, For example Fig. 9).

With respect to claim 3, Wu discloses conductive metal comprises Ta, TaN, Ti, TiN, W, WN, Nicr, Sicr or a metal silicide (Column 7, lines 9).

With respect to claim 5, Wu discloses conductive metal has a thickness from about 20 to about 50 nm (column 5, lines 46-48 and 54-56).

With respect to claim 6, Wu discloses an etch stop layer (540, For example Fig. 10) located beneath said conductive metal.

With respect to claim 7, Wu discloses etch stop layer has a thickness from about 20 to about 50 nm (column 5, lines 30-32).

With respect to claim 8, Wu discloses a dielectric material (450, For example Fig. 4) on said at least one resistor.

With respect to claim 10, Wu discloses at least one FEOL device comprises a field effect transistor, a bipolar transistor, a BiCMOS device, or a passive device (920 as drain/source, 915 as gate of the transistor, For example Fig. 10).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wu in view of Osanai et al. (6,777,752).

With respect to claim 4, Wu discloses the invention set forth in claim 1 but did not disclose conductive metal comprises TiN, TaN, Nicr or Sicr.

Osanai discloses conductive metal comprises TiN, TaN, Nicr or Sicr (Column 50, lines 12-19).

Since Wu and Osanai are both from the same field of manufacturing a semiconductor device, the purpose disclosed by Osanai would have been recognized in the pertinent art of Wu.

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to have use Osanai Titanium nitride in Wu conductive member, Titanium silicide, for the purpose of using titanium nitride an excellent combination of performance properties, attractive appearance, and safety, also maintaining sharp edges or corners prevent galling, seizing or cold-welding and withstands high temperatures.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wu in view of Erdeljac et al. (5,554,873).

With respect to claim 9, Wu discloses the invention set forth in claim 1 but did not disclose first level of metallization comprises an inter-level dielectric material having contact openings that are filled with a conductive material.

Erdeljac discloses first level of metallization (54, For example Fig. 11) comprises an inter-level dielectric material (52, For example Fig. 11) having contact openings that are filled with a conductive material (54, For example Fig. 11).

Since Wu and Erdeljac are both from the same field of manufacturing a semiconductor device, the purpose disclosed by Erdeljac would have been recognized in the pertinent art of Wu.


Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to have use Erdeljac contact metal with a dielectric material opening in Wu invention for the purpose of having a contact metal with dielectric layer in between can prevent short circuit when connecting the device and also less complicated to reach to the device and with the contact metal it can have more layer forming on top of the device so that more space can be use.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tsz K. Chiu whose telephone number is 517-272-8656. The examiner can normally be reached on 0800 to 1700.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra V. Smith can be reached on 571-272-2429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TKC
January 19, 2006


ZANDRA V. SMITH
SUPERVISORY PATENT EXAMINER
20 Jan. 2006

Application/Control Number: 10/710,847
Art Unit: 2822

Page 6